

AF/2800

TRANSMITTAL OF APPEAL BRIEF (Small Entity)

Docket No.
MAC-10102/29

In Re Application Of: Hays et al.

MAR 26 2003

Serial No.
10/076,165

Filing Date
Feb. 14, 2002

Examiner
T. Dougherty

Group Art Unit
2834

Invention: TEMPERATURE-COMPENSATED PIEZOELECTRIC FORCE MOTOR

TO THE ASSISTANT COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:

Applicant is a small entity under 37 CFR 1.9 and 1.27.

A verified statement of small entity status under 37 CFR 1.27:

- ☐ is enclosed.
☐ has already been filed in this application.

The fee for filing this Appeal Brief is: \$160.00

- ☒ A check in the amount of the fee is enclosed.
☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account. A duplicate copy of this sheet is enclosed.
☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 07-1180
A duplicate copy of this sheet is enclosed.

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Dated: March 21, 2003

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I certify that this document and fee is being deposited on 3/21/03 with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Assistant, Commissioner for Patents, Washington, D.C. 20231.

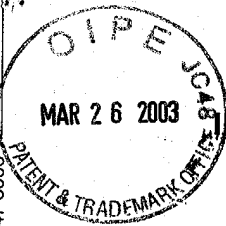
Sheryl L. Hammer

Signature of Person Mailing Correspondence

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cc:



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF APPEALS AND INTERFERENCES

Appellant: Paul B. Hays et al.

Serial No.: 10/076,165

Group Art Unit: 2834

Filing Date: February 14, 2002

Examiner: Thomas M. Dougherty

Title: TEMPERATURE-COMPENSATED PIEZOELECTRIC FORCE MOTOR

APPEAL BRIEF

Box AF
Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

I. Real Party in Interest.

The real parties in interest are inventors Paul B. Hays and Greg Ritter, both U.S. citizens.

II. Related Appeals and Interferences.

There are no related appeals or interferences.

III. Status of Claims.

Claims 1-4 are pending in this application, with claims 1-3 being under appeal. Claim 4 has been deemed allowable by the Examiner.

IV. Status of the Amendments.

No amendments have been filed subsequent to the final rejection made in the Office Action Summary dated October 18, 2002.

V. Summary of the Invention.

This invention resides in an improved, temperature-compensated piezoelectric force motor featuring greater dynamic range and robustness as compared to previous motor designs (Specification, page 4, lines 2-4). By implementing positive and negative expanding elements, the

overall motor length can be held constant over temperature, thereby achieving a temperature expansion coefficient that approaches zero (Specification, page 4, lines 4-6).

The inventive device is based upon a stacked PZT transducer wherein a central structural member is stretched to increase its rigidity and robustness. This central stretching removes the PZT element from the load path of the motor when the motor is relaxed, thereby preventing damage to the element during assembly (and during launch with respect to space-borne applications) (Specification, page 4, lines 7-11). When the piezoelectric element is powered, this central structural member also improves the failure strength of the assembly to further increase the robustness of the motor design (Specification, page 4, lines 11-13).

The invention also has the advantage that the capacitance of the feedback system can be changed after the motor has been assembled. This allows the nominal capacitance to be optimized and standardized for the nominal controller capacitance (Specification, page 4, lines 14-16). This improves the manufacturability in that this is no longer a single point failure mechanism in the assembly (Specification, page 4, lines 16-18).

The invention finds applicability in various commercial products including, but not limited to, scientific etalons, nanopositioning systems, custom fiber optic assemblies, and custom CCD detectors (Specification, page 4, lines 19-21).

VI. Issues.

As set forth in the Office Action Summary having a mailing date of October 18, 2002, there are two issues in this appeal, namely:

1. Are claims 1-2 anticipated by Lawless et al. (U.S. Patent No. 5,222,713) under 35 U.S.C. §102(b)?
2. Is claim 3 unpatentable over Lawless et al. ('713) in view of Tsuruga (JP 2-197180) under 35 U.S.C. §103(a)?

VII. Grouping of Claims.

Appellants believe the following group of claims represents distinct subject matter for consideration by the Board:

Group I: Claims 1-2, wherein claim 2 stands or falls with claim 1; and

Group II: Claim 3.

VIII. Argument.

Group I: Claims 1-2, Wherein Claim 2 Stands Or Falls with Claim 1.

Claim 1 stands rejected under 35 USC 102(b) as being anticipated by Lawless et al., U.S. Pat. No. 5,222,713. Anticipation has always been held to require absolute identity and structure between the claimed structure and a structure disclosed in a single reference.

"For prior art to anticipate under §102 it has to meet every element of the claimed invention." In *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (Fed. Cir. 1986)

Claim 1 has been amended to include "a PZT element concentrically supported about a portion of the housing." It is respectfully submitted that claim 1 as amended is no longer anticipated by Lawless et al. and is in proper condition for allowance.

Claim 2 depends on amended claim 1 and thus includes all of its limitations which are believed to be allowable. As such, Appellants respectfully request that this be withdrawn as a basis for rejection.

Group II: Claim 3.

Claim 3 stands rejected under 35 USC 103(a) as being unpatentable over Lawless et al. in view of Tsuruga JP 2-197180. In rejecting claims under 35 USC 103, the Examiner must provide a reason why one having ordinary skill in the pertinent art had been led to modify the prior art or combine the references to arrive at Appellants' claimed invention. There must be something in the prior art that suggested the combination other than the hindsight gained from knowledge that the inventor chose to combine these particular things in this particular way. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988).

The present invention includes a plurality of components in series within the housing of the motor that exhibit both positive and negative coefficients of thermal expansion which cooperate to cancel one another so as to reduce the overall temperature expansion coefficient of the motor. There is nothing in the combination of Lawless et al. and Tsuruga that suggests the use of a series of non-

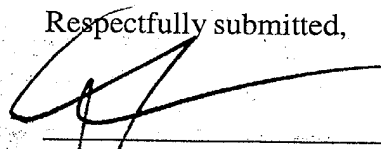
piezoelectric components having different coefficients of thermal expansion to achieve a cancellation operative to maintain the overall length of the subject motor constant.

Further, the combination of Lawless et al. and Tsuruga would not result in the structure claimed as according to the invention. The piezoelectric element of the present invention is used to stretch a central structural member of the motor housing such that the overall rigidity and robustness of the motor design is improved. The present invention does not claim to rely on the coefficient of thermal expansion of the PZT. There must be something in the prior art that suggested the combination, other than hindsight gained from knowledge that the inventor chose to combine these particular things in this particular way. *Id.* 1438. From the foregoing amendment and remarks, Appellants respectfully request that this be withdrawn as a basis for rejection.

Conclusion.

From the foregoing, Appellants submit that none of the present claims are anticipated or obvious over any permissible use of the prior art of record. Accordingly, the claims define patentable subject matter and are in condition for allowance. Such action is respectfully requested.

Respectfully submitted,



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APPENDIX A

CLAIMS ON APPEAL

1. An improved piezoelectric (PZT) force motor, comprising:
a housing having opposing ends;
a PZT element concentrically supported about a portion of the housing, said PZT element being operative to expand and contract the ends of the housing through the application of an electric signal; and
a plurality of components in series within the housing exhibiting both positive and negative coefficients of thermal expansion which cooperate to cancel one another so as to reduce the overall temperature expansion coefficient of the motor.
2. The improved piezoelectric force motor of claim 1, wherein the PZT element is a stacked structure.
3. The improved piezoelectric force motor of claim 1, wherein the components include:
a first member which expands in one direction; and
a second member which expands in the opposite direction.